

INCENTIVE CONTRACTING

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Presentation Defined

- **“An overview of various contract tools that can be implemented to incentivize our contractors in cost, schedule, and performance. Developing tools to incentivize all three legs of this stool is difficult. This session also includes an explanation and discussion of contract geometry of incentive arrangements.”**
- **Def: Incentive - [L. incentivus, fr. incinere to strike up or set the tune, fr. In-+canere, to sing]
1. Inciting; stimulative 2. That which incites, or tends to incite, to determination or action; motive; spur**
- **STEP 1 - DO YOU BELONG HERE?**

Index

- **Types of Incentives**
- **Multiple Incentives**
- **Cost Incentive Contracts**
- **3 Ways to Develop Contract Geometry**
- **Pitfalls Associated with an Incentive Contract**
- **My Lessons Learned**
- **Cost Incentive Take Aways**

Types of Incentives

- **Performance Incentive**
 - **Product Characteristic (Range/Speed/Thrust)**
 - **Technical Performance (Overall performance of end item)**
- **Delivery Incentive (Improve from Required Schedule)**
- **Cost Incentive (Manage Cost) ***
- **Multiple-Incentive ***
- **Other**

Multiple Incentives

- **What Are They?**
- **What Are They For?**
- **How Do They Work?**
- **Example**
- **Graphs**
- **Take Aways**

Multiple Incentives - What Are They?

- **Incentives Involving Schedule, Performance, Cost Control - Three Legs of the Stool**
- **Combination of**
 - **Motivation (Tech Progress, Timely Deliv, Effect Cost Control**
 - **Ultimate Objective (Balance between 3 Legs)**
- **Basic Elements - Cost Incentive, Increased/Decreased Fee/Profit, Balanced Incentive Structure**

Multiple Incentives - What Are They For?

- **Attain Appropriate Balance between the 3 Legs of the Stool**
- **Quantitatively relate Profit Motivation with Government Objectives**
- **Cost Incentive drives Minimum Acceptable Performance : Multiple Incentive - Maybe/Maybe Not - best combination**

Multiple Incentives - How Do They Work?

- **6 Steps**
 - **Select Parameters (Cost Must Be One)**
 - **Establish Optimistic, Pessimistic, Target Outcomes for Non-Cost Performance Parameters**
 - **Optimistic - Achievable and Of Value to Gov't**
 - **Pessimistic - Acceptable to Gov't**
 - **Estimate Target Cost and Target Fee/Profit**
 - **Estimate Optimistic/Pessimistic Cost Outcomes**
 - **Establish Fee Pool**
 - **Establish Relative Importance of Incentivized Parameters**

Multiple Incentives - Example

- **Cost Structure (CPIF)**

- Target Cost = 120
- Target Fee = 10
- Max Fee = 18 (10 + 4 + 2 + 2)
- Minimum Fee = 2 (10 - 4 - 2 - 2)
- Share 80/20
- Fee Swing = +-8

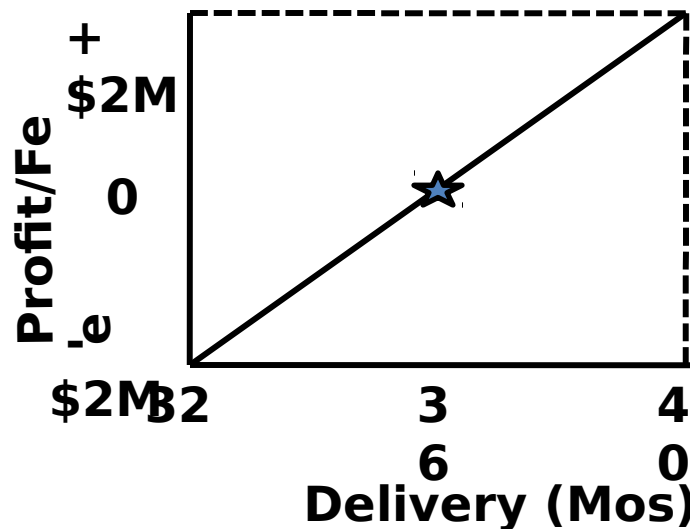
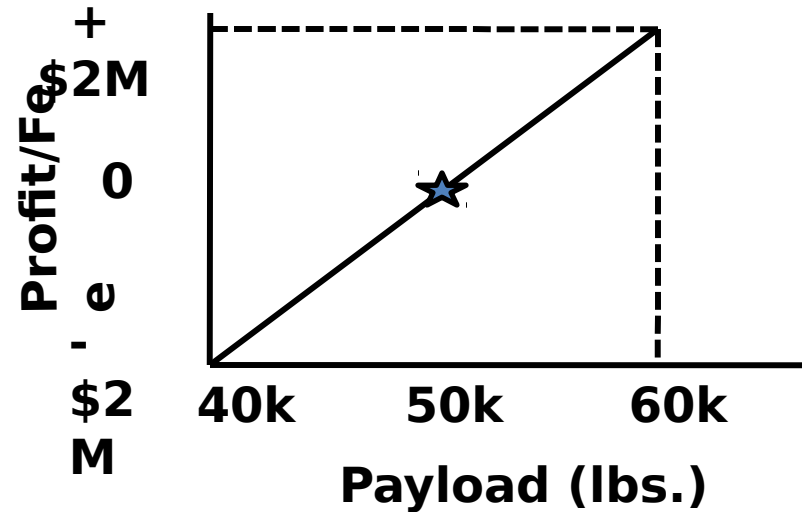
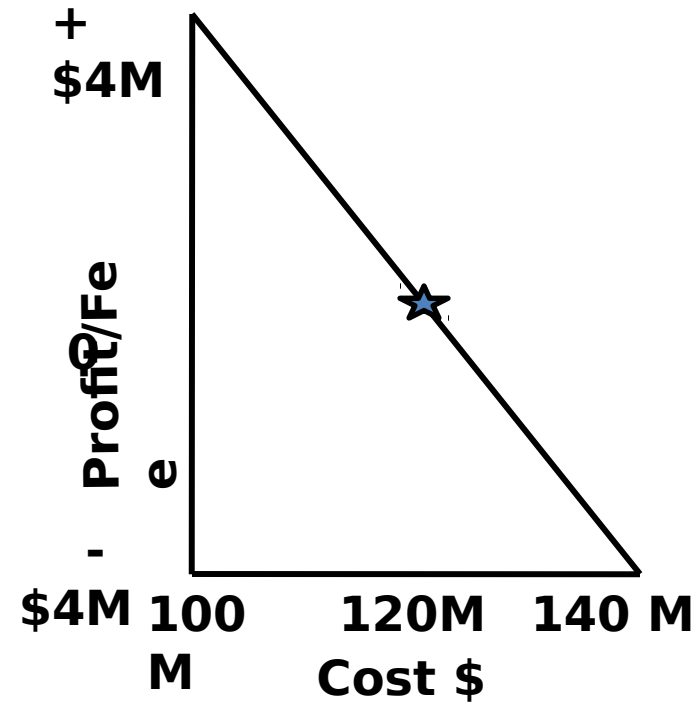
- **Performance (Payload)**

- Range 40k (MP), 50k (T), 60k (MO) +- \$2M

- **Delivery**

- Range 40 Mos (MP), 36 Mos (T), 32 Mos (MO) +- \$2M

Multiple Incentives - Graphing



“Goalposting the Incentives”

 **Target**

Multiple Incentives - Examples

- **Program 1 CPOIF - Fixed 2%, Event 1 - 2%, Event 2 - 2%, Initial Performance Eval 3%, Event 4 - 2% - 7 pages tables, interim evals, mixes schedule with tech perf, cost interims uses CPR data**
- **Program 2 - Cost Incentive 6% - Performance 4% (all or none), 2% other**
- **Program 3 - Fixed 3%, 7% cost/sched/tech incentive (all or none)**
- **Program 4 - 3% min/5% max cost (70/30), 9% delivery key milestones (6 at 1%, 1 at 3%), 6 yr failure period 5 critical functions, up to 10% repayment**

Multiple Incentives - Take Aways

- **Know What Behavior You Want**
- **Know What Behavior You Will Drive**
- **Analyze Potential Trade-offs - Want Balance**
- **Keep Simple - Assessment Can Be Difficult**
- **Detailed information in DoD/NASA Incentive Guide, Army Guide, Navy Guide, etc.**

Cost Incentive Contracts

- **Types**
- **Uses**
- **Descriptions**
- **Elements**
- **Central Theme**
- **Quick Refresher**

Cost Incentive Contracts

- Types

- **Fixed-Price Incentive (F??)**
- **Fixed-Price Incentive (Successive Targets)**
- **Fixed-Price with Award Fee**
 - **No Objective Measurement**
 - **Award Fee in Addition to F&R Profit**
 - **Exceed Satisfactory Performance**
- **Cost-Plus-Incentive-Fee**
- **Cost-Plus-Award-Fee**
 - **Base Fee Fixed**
 - **Motivate Excellence Quality, Timeliness, Technical Ingenuity, Cost Effective Mgt**
 - **No Trade Offs at Expense of Min Reqts**

Cost Incentive Contracts - Uses

- **Purpose: Incentivize Cost Control**
- **Result: Influence Behavior**
- **Establishes Profit/Fee formula**
- **Share Ratio is always meaningful**
- **FPIF and CPIF are “Cost Type” Contracts**

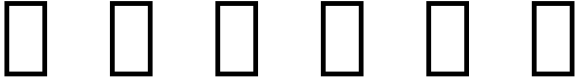
Cost Incentive Contracts - **Descriptions**

- **Fixed-Price Incentive Firm (FPIF)**
- **Fixed-Price Incentive - Successive Targets (FPIS)**
- **Fixed-Price with Award Fee (FPAF)**
 - **No Objective Measurement**
 - **Award Fee in Addition to F&R Profit**
 - **Exceed Satisfactory Performance**
- **Cost-Plus-Incentive-Fee (CPIF)**
- **Cost-Plus-Award-Fee (CPAF)**
 - **Base Fee Fixed**
 - **Motivate Excellence Quality, Timeliness, Technical Ingenuity, Cost Effective Mgt**
 - **No Trade Offs at Expense of Min Reqts**

Cost Incentive Contracts - **Elements**

- **Fixed-Price Incentive Firm**
 - Target Cost \$
 - Target Profit \$
 - Contractor Share % for both Under and Over Target
 - Ceiling \$ Amount
- **Cost Plus Incentive Fee**
 - Target Cost \$
 - Target Fee \$
 - Contractor Share (cents/dollar) for both Under and Over Target
 - Max Fee (% of target cost)
 - Min Fee (% of target cost)

Central Theme

- **Emperor Napoleon Bonaparte said "Un bon croquis vaut mieux qu'un long discours"**
- **"A good sketch is better than a long speech"**
- 
- **One Picture is Worth 10,000 Words**

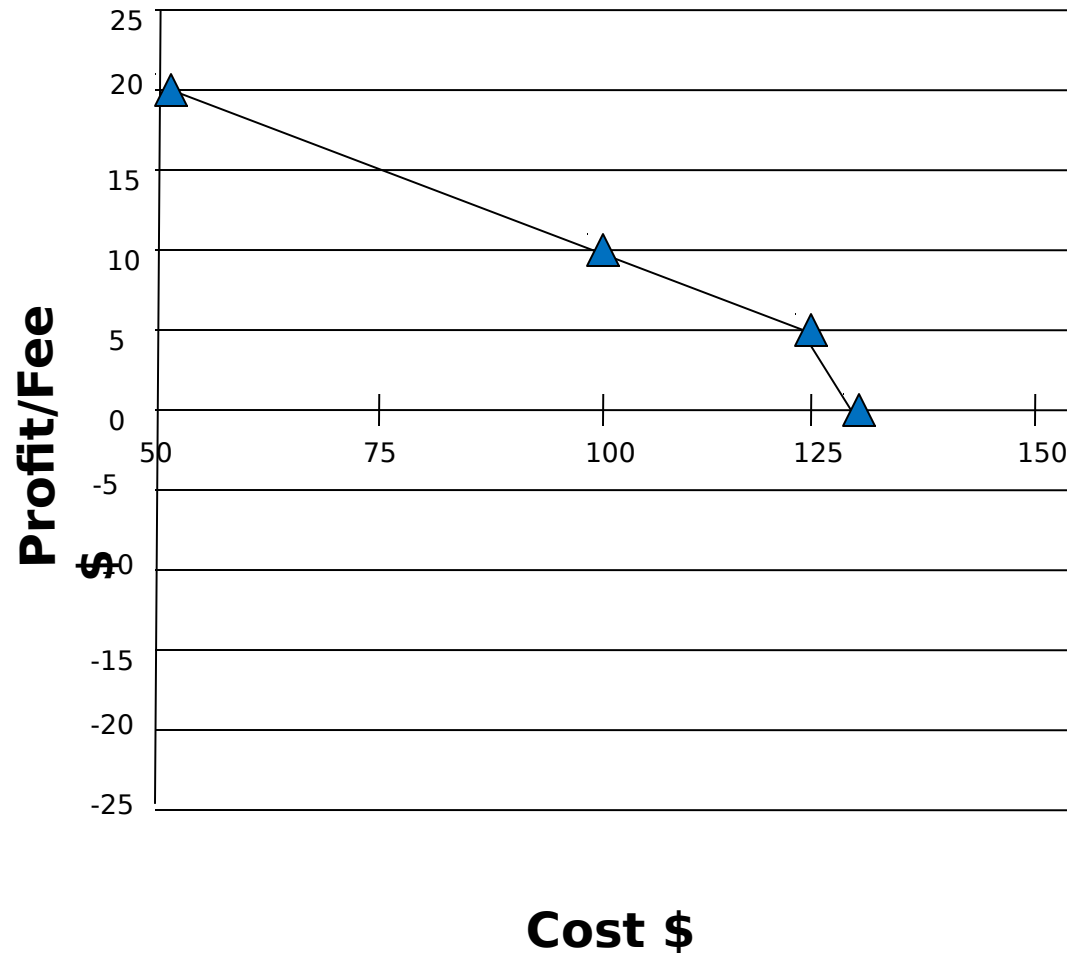
Quick Refresher

- **How to Draw the Graph**
- **Graphing an FPIF**
- **What Is PTA?**
- **Name that Contract Type**
- **Range of Incentive Effectiveness**
- **Another Test**
- **Graphing Matters**

How to Draw the Graph

- **Plot Targ Cost and Profit/Fee**
- **Plot An Underrun Point**
- **Calculate PTA COST $((\text{Big \#} - \text{Next Big \#}) / \text{Gov't Share}) - \text{Next Big\#}$**
- **Plot PTA point (Calc PTA cost, Derived PTA Profit)**
- **Connect the Dots**
- **Plot Ceiling**
- **Connect the Remaining Dots**

Graphing an FPIF

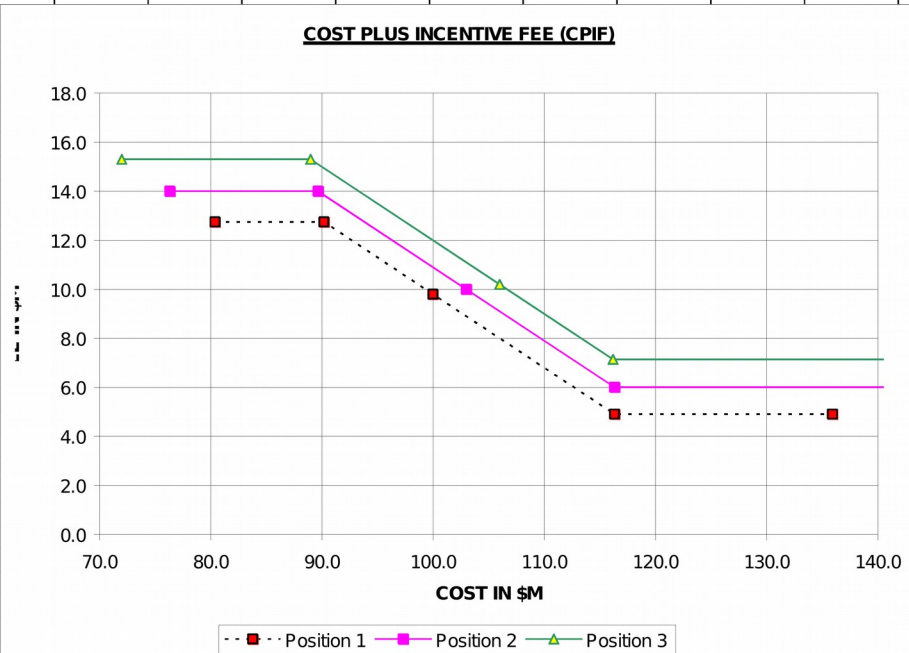


Target Cost = 100
Target Profit = 10
Share Ratio = 80/20
Ceiling = 130

COST PLUS INCENTIVE FEE GRAPHICS/GEOMETRY

	Pos 1	Pos 2	Pos 3
BASE COST	98.0	100.0	102.0
COM	2.0	3.0	4.0
COST	100.0	103.0	106.0
PROFIT	9.8	10.0	10.2
PRICE	109.8	113.0	116.2
MAX PROFIT	12.7	14.0	15.3
MIN PROFIT	4.9	6.0	7.1
TARG PROFIT	10.00%	10.00%	10.00%
Underrun SHARE	70.00%	70.00%	70.00%
Overrun SHARE	70.00%	70.00%	70.00%
PROFIT FLOOR	5.00%	6.00%	7.00%
PROFIT CEILING	13.00%	14.00%	15.00%

GRAPH PTS	COST	PROFIT
Position 1:		
INITIAL PT	80.4	12.7
INITIAL BEND	90.2	12.7
TARGET	100.0	9.8
POST BEND	116.3	4.9
FINAL PT	135.9	4.9
Position 2:		
INITIAL PT	76.3	14.0
INITIAL BEND	89.7	14.0
TARGET	103.0	10.0
POST BEND	116.3	6.0
FINAL PT	143.0	6.0
Position 3:		
INITIAL PT	72.0	15.3
INITIAL BEND	89.0	15.3
TARGET	106.0	10.2
POST BEND	116.2	7.1
FINAL PT	150.2	7.1



*Instructions for using this Model:

--**ONLY** change the cells that have **BLACK** colored font. **DO NOT** change the formulas in the cells that have **WHITE** colored font.

--If you want to change the numbers/format of the axis in the graph, either **RIGHT** click on the axis and select "Format Axis" or click on the chart itself and use the Chart wizard by clicking on the icon for "Format Axis."

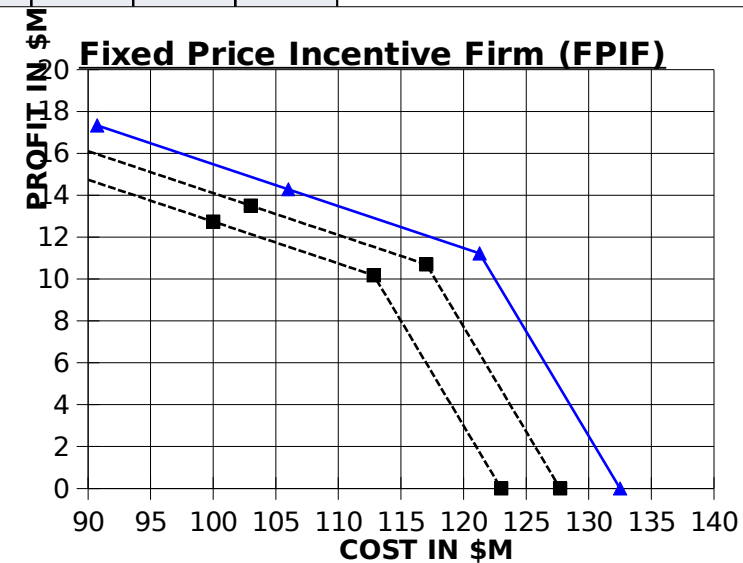
--Make sure to **SAVE** the changes you have made.

FIXED PRICE INCENTIVE FIRM GRAPHICS/GEOMETRY

*INSTRUCTIONS BELOW

	Pos 1	Pos 2	Pos 3
BASE COST	98.0	100.0	102.0
COM	2.0	3.0	4.0
COST	100.0	103.0	106.0
PROFIT	12.74	13.5	14.28
PRICE	112.74	116.5	120.28
CEILING	123	127.72	132.5
CEILING %	1.23	1.24	1.25
PROFIT %	0.13	0.135	0.14
PTA COST	112.825	117.025	121.275
PTA PROFIT	10.175	10.695	11.225
O/R SHARE	0.8	0.8	0.8
U/R SHARE	0.8	0.8	0.8

GRAPH PTS	COST	PROFIT
Position 1:		
INITIAL PT	87.175	15.305
TARGET	100	12.74
PTA	112.825	10.175
CEILING	123	0
Position 2:		
INITIAL PT	88.975	16.305
TARGET	103	13.5
PTA	117.025	10.695
CEILING	127.72	0
Position 3:		
INITIAL PT	90.725	17.335
TARGET	106	14.28
PTA	121.275	11.225
CEILING	132.5	0



-----■----- Position 1-----■----- Position 2

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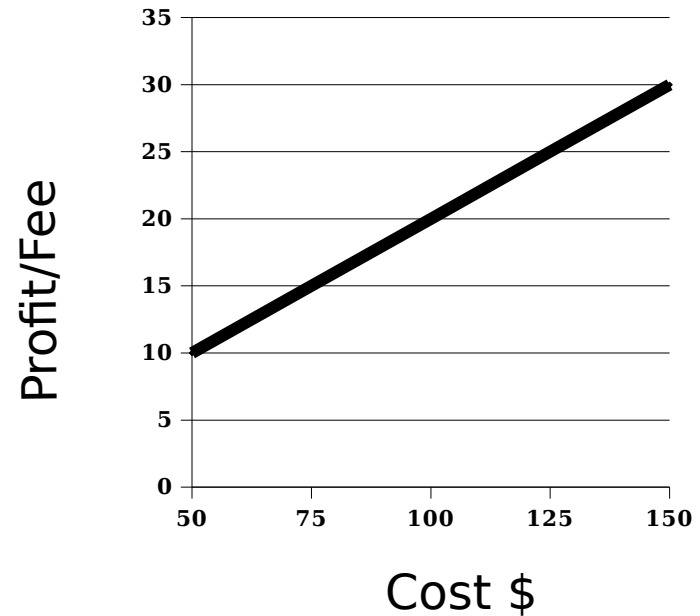
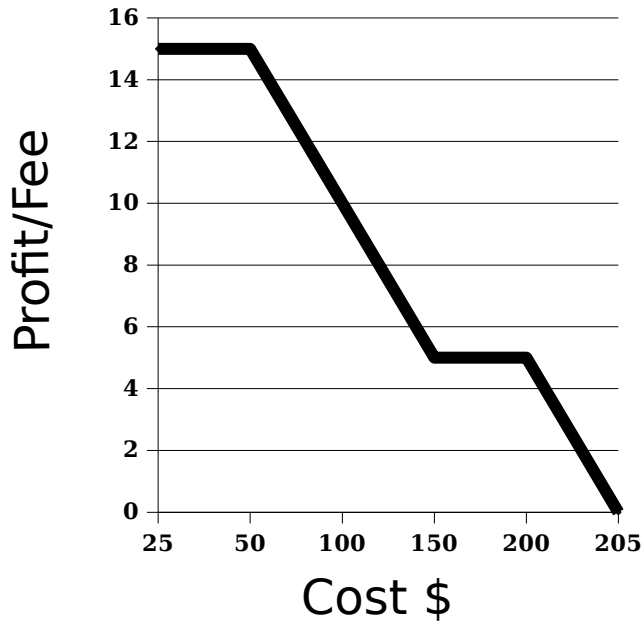
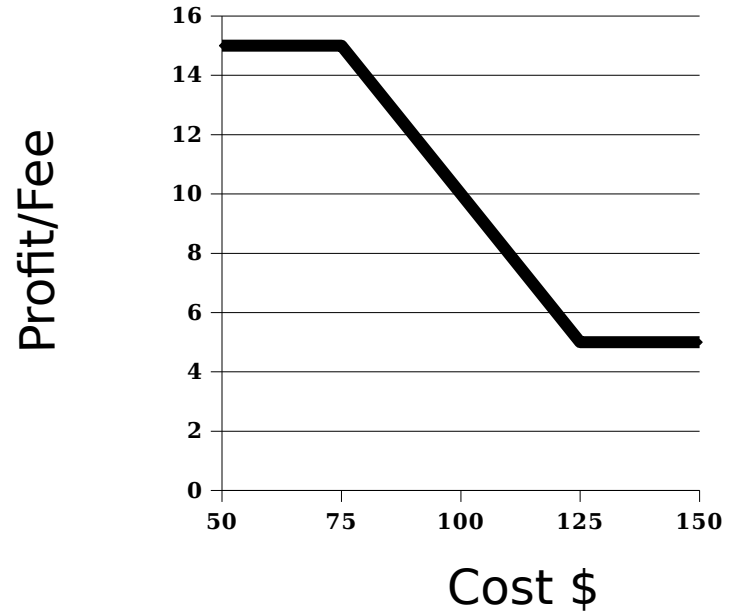
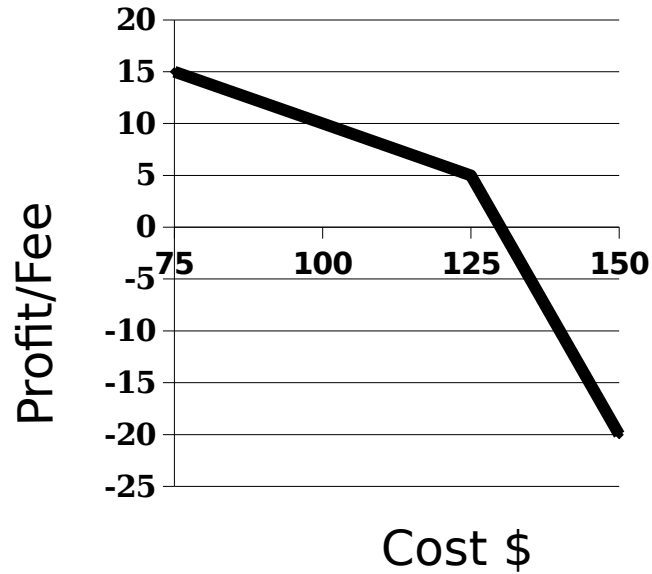
What Is PTA?

- ✦ **Point (Actually a Cost) of Total Assumption**
- ✦ **Maximum Price Paid by Government**
- ✦ **Elbow of Graph**
- ✦ **Intersection of Share line past Target Cost with the 0/100 line prior to Ceiling**
- ✦ **$((CP - TP)/GS) + TC = \text{PTA Cost}$**
- ✦ **Where cost risk entirely on Contractor**
- ✦ **Where contract becomes FFP**

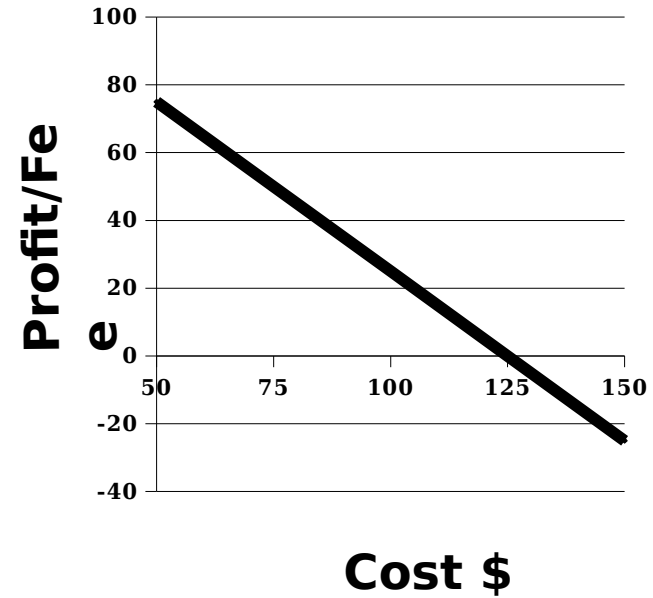
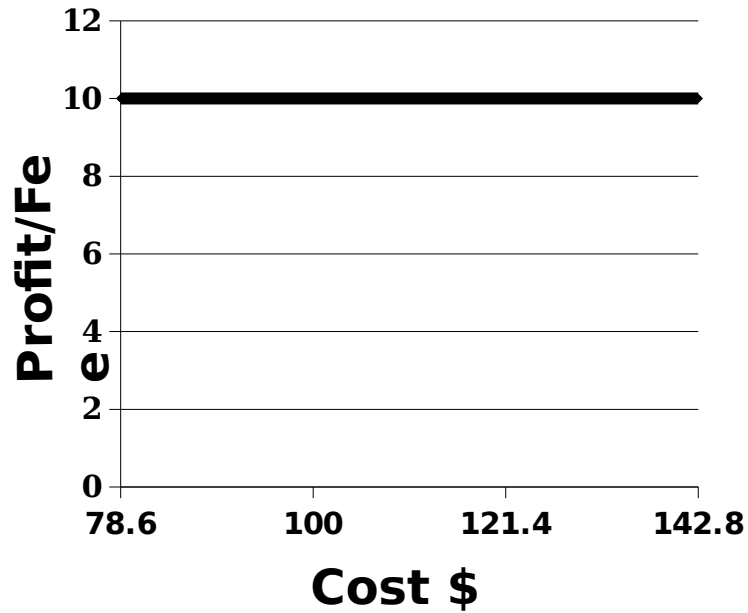
PTA Formulas

- ✦ **$PTAc = ((CP - TP)/GS) + TC$**
- ✦ **$CP = PTAc + PTAp$**
- ✦ **$GS + CS = 100$**
- ✦ **$GS = (CP - TP)/(PTAc - TC)$**
- ✦ **$PTAp = (PTAc - TC)(1 - CS) + TP - PTAc$**
- ✦ **$PTAp = TP - CS(PTAc - TC)$**
- ✦ **$PTAp = CP - PTAc$**
- ✦ **$CS = (TP - PTA_p)/PTAc - TC$**
- ✦ **And on and on and on and on**

NAME THAT CONTRACT TYPE



NAME THAT CONTRACT TYPE (Cont.)



Range of Incentive Effectiveness

- **Computed from Target Cost, Optimistic Cost (Low Cost Estimate - LCE), and Pessimistic Cost (High Cost Estimate - HCE)**
- **Area of Cost**
 - **Incentive Meaningful**
 - **FPIF : from PTA to Target Cost then to Approx Equal Distance Underrun**
 - **CPIF : from Max Fee elbow to Min Fee elbow**
- **Critical Component for O/P/TC Methodology**

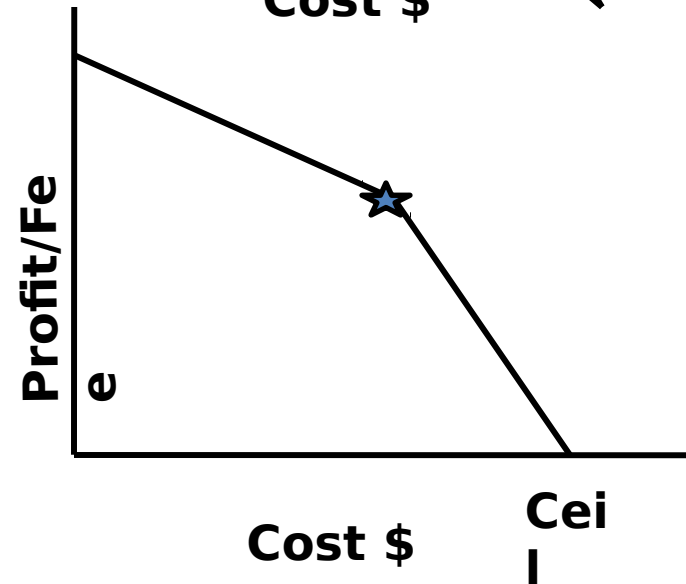
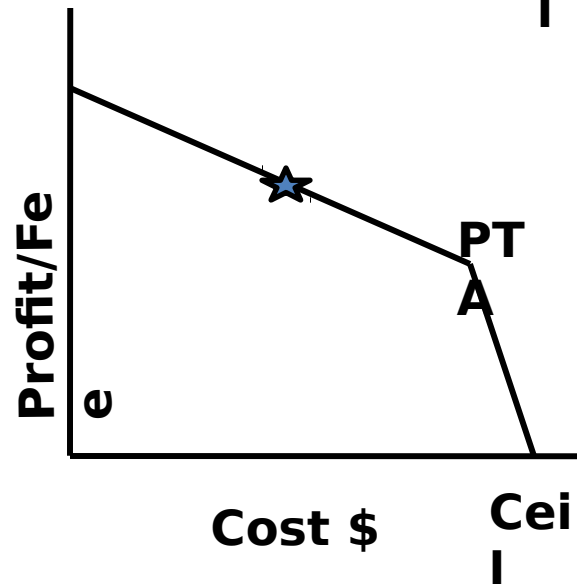
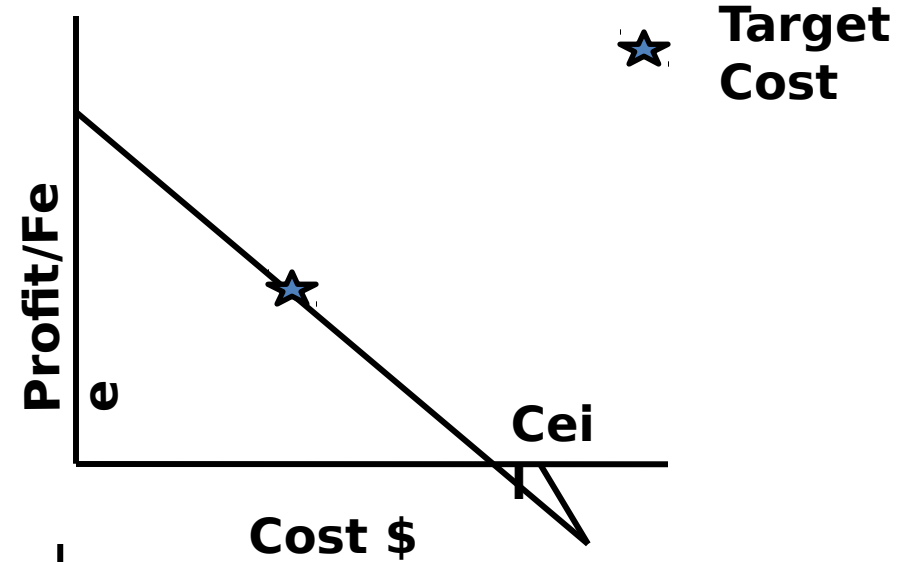
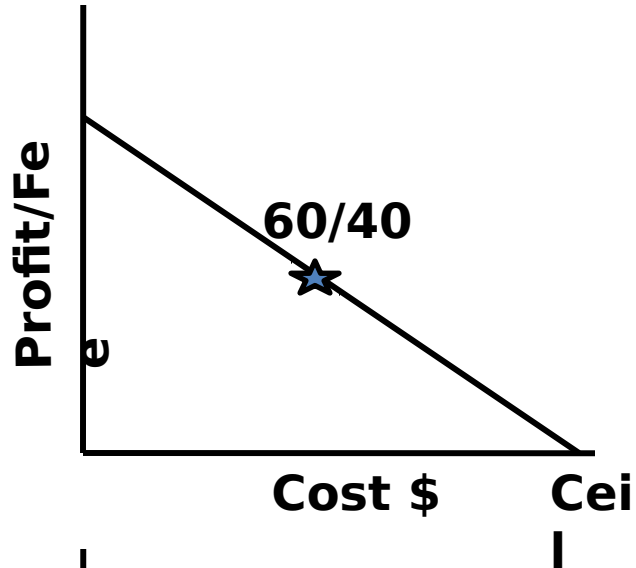
Another Test

- **DESCRIBE GRAPH**

- **158 cost, 16 profit, 60/40 share, 198 ceiling (125%)**
- **298 cost, 30 profit, 70/30 share, 400 ceiling (135%)**
- **515 cost, 60 profit, 80/20 share, 671 ceiling (130%)**
- **400 cost, 60 profit, 75/25 share, 460 ceiling (115%)**

- **Avoid Embarrassment - Know what you got**

Graphing Matters



3 Ways to Develop Contract Geometry

- **Optimistic, Pessimistic and Target Cost (OPTC) Methodology**
 - **Example**
 - **Graphs**
- **Worm Analysis Methodology**
 - **Examples**
- **Logical Structure Methodology**

Optimistic, Pessimistic and Target Cost (OPTC)

Methodology

- Establishes Range of Incentive Effectiveness
- Compute Target Cost, Target Profit/Fee, LCE, HCE
- Can Be Used To Compute Share Ratio (FPIF/CPIF), Min/Max fee (CPIF), Ceiling (FPIF)
- Requires: Target Cost and Profit/Fee - cost analysis - WGL - Fair and Reasonable
- Compute Pessimistic - considered likely “worst case” cost and appropriate profit/fee
- Compute Optimistic - considered likely “best case” cost and appropriate profit/fee
- Pessimistic gives PTA (FPIF) or min fee (CPIF)
- Optimistic gives max fee (CPIF)

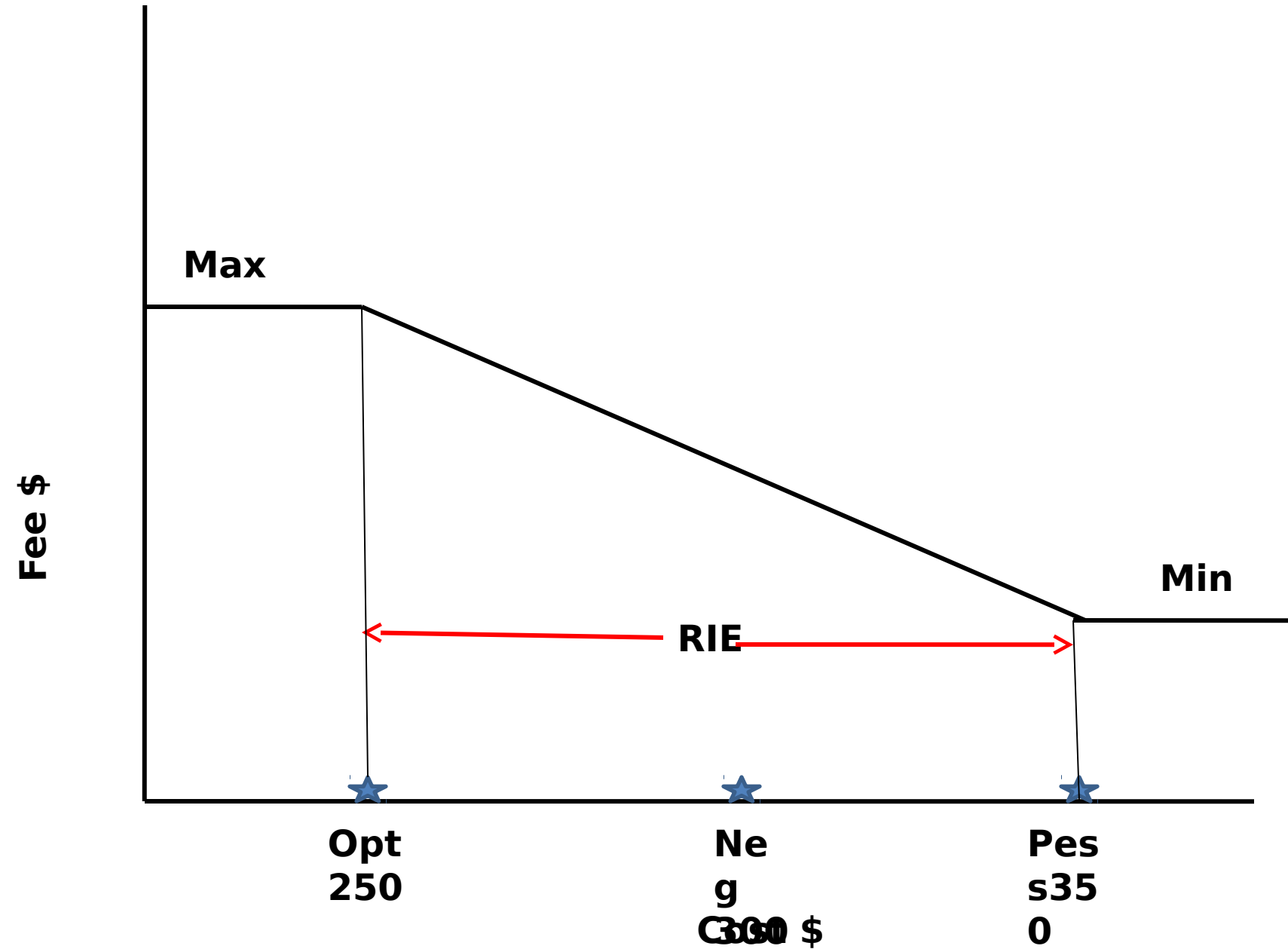
Optimistic, Pessimistic and Target Cost (OPTC)

	Opt	Neg	Pess	<u>Methodology</u>		
Material	95	110	125			
Material O/H	18		20		21	
Engineering		24		30		35
Engineering O/H		4		5		6
Manufacturing		60		70		83
Manufacturing O/H		8		10		12
Other Charges		8		10		12
G & A		28		40		51
Cost Of Money		5		5		5
Total		250		300		350

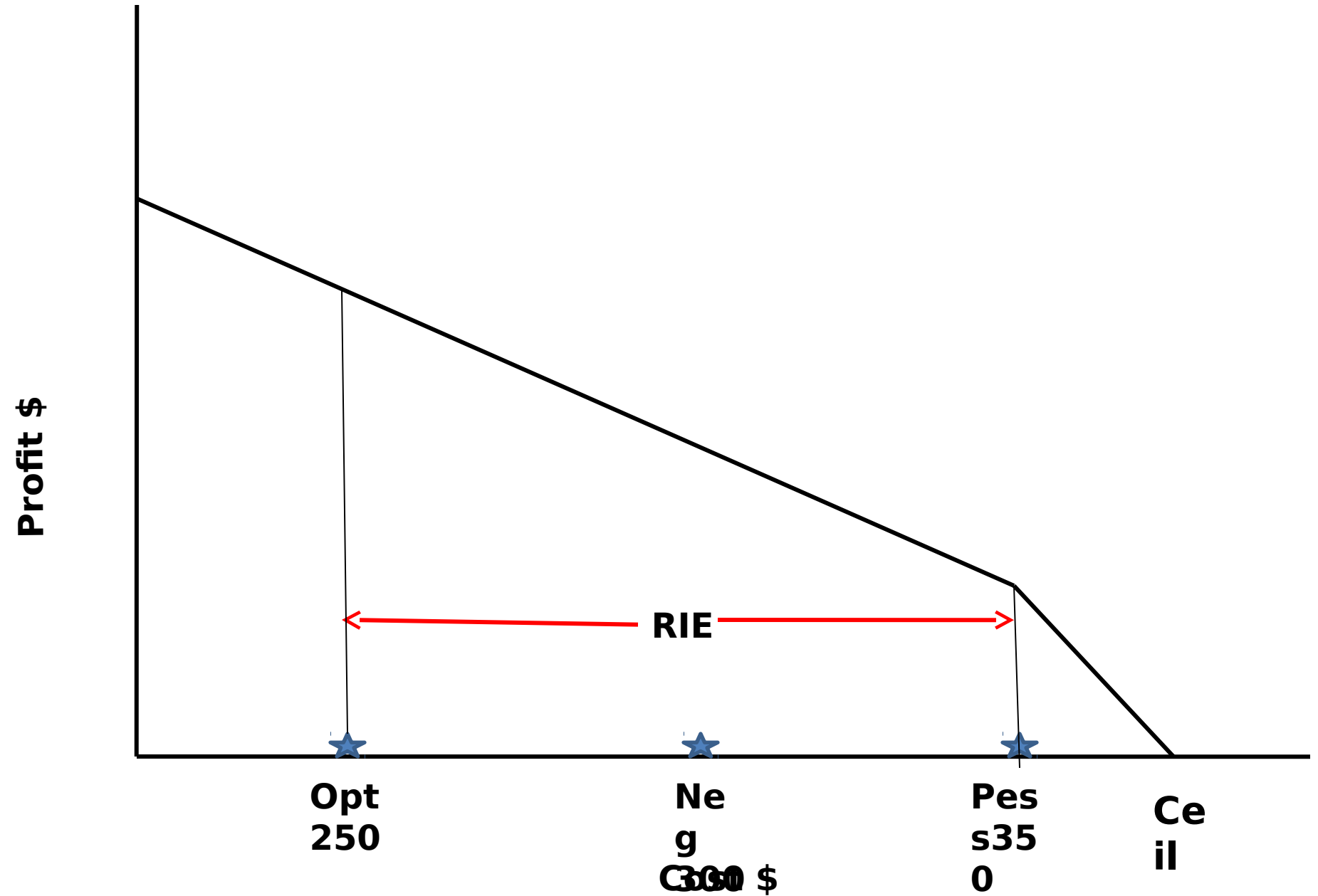
OPTC Methodology - **Simple Example**

- **Target Cost = 300 (through cost analysis)**
- **Target Profit/Fee = 30 (through WGL)**
- **Optimistic Cost = 250 (through adjusted cost element analysis)**
- **Pessimistic Cost = 350 (through adjusted cost element analysis) - HAVE RIE**
- **Optimistic Fee (Max for CPIF) = 45 (through adjusted WGL)**
- **Pessimistic Profit (PTA)/Fee (Min) = 15 (through adjusted WGL, 2-3% unallowables, Fac Cap Empldyd, Worm Analysis, Other?)**

O/P CPIF Graph



O/P FPIF Graph



Worm Analysis Methodology

- **Computes PTA profit which then provides ceiling price given share ratio, or share ratio given ceiling price**
- **Profit at PTA cost (0/100 SHARE, FFP STARTS, etc.), consists of profit dollars without shared cost risk, should reflect a cost level within the control of the contractor, and thus, would be the total responsibility of the contractor**
- **The cost control and contract type factors from WGL consist of those profit dollars associated with cost risk within the cost incentive structure and whose risk we share - other factors are considered the responsibility of the contractor and not unlike FFP**

Profit at PTA = WGL Profit - cost control - contract type

Ceiling Price = PTA cost + PTA profit

**PTA cost = Target cost + (Targ profit - PTA profit)
Contractor share**

OR

Contractor Share = (Targ profit - PTA profit)/(PTA cost - Targ Cost)

Worm Analysis Methodology - **Simple Example #1**

- **Target Cost = 300, Target (WGL) Profit = 30**
- **Cost Control = 7 and Contract Type = 3**
- **Use PTAcost = Pess = 350 to Derive Share**
- **PTA Profit = $30 - 7 - 3 = 20$**
- **Ceiling = 370 (Pess 350 + PTApr 20)**
- **Contractor Share = $(30 - 20)/(350 - 300) = .20$**

Worm Analysis Methodology -

Simple Example #2

- **Target Cost = 300, Target (WGL) Profit = 30**
- **Cost Control = 7 and Contract Type = 3**
- **Use Share = 80/20 to Derive PTAcost and Ceiling**
- **PTA Profit = $30 - 7 - 3 = 20$**
- **PTA Cost = $300 + ((30 - 20)/.2) = 350$**
- **Ceiling Price = 370 (PTAcost 350 + PTAprofit 20)**

Logical Structure Methodology

- **Mixture of Worm + O/P, add dash of gut logic, strain out some limitations**
- **Provides: Coordinated/Logical cost/profit/share/ceiling at different risk levels**
- **Requires: Weighted Guidelines assessment - Note Contract Type Risk (FFP 2-4, FPIF/CPIF 0-2, CPFF 0-1)**
- **Assures: Contract Type Characteristics Exist - PTA**
- **Considers: Continuum Risk/RIE from Cost to Fixed Type**

Logical Structure Methodology

(cont)

- **Examples (assumes 1% COM):**
 - **85/15 share, 11% profit, 135% ceiling, PTA 81%**
 - **80/20 share, 11.5% profit, 131% ceiling, PTA 79%**
 - **75/25 share, 12% profit, 128% ceiling, PTA 77%**
 - **70/30 share, 12.5% profit, 125% ceiling, PTA 72%**
 - **65/35 share, 13% profit, 123% ceiling, PTA 68%**
 - **60/40 share, 13.5% profit, 122% ceiling, PTA 65%**
- **Note: the more cost type - flatter share - lower profit - higher ceiling - larger RIE**
- **Note: the typical FPIF range within 2/3 to 3/4**

Pitfalls Associated with an Incentive Contract

- **Influence the Wrong Behavior**
 - **Best for Gov't Not Always Obvious (Long vs Short Term)**
 - **Multiples - hurt one for another**
- **Must have approved accounting system**
- **Administration Cost**
 - **Price Redetermination (audit, negotiation)**
 - **Award Fee Tracking**
- **Funding Not Certain**
- **Requires Knowledge/Understanding**

My Lessons Learned

- **“The Story”: which is better deal**
 - **Target Price 110, Share 80/20, Ceiling 130%**
 - **Target Price 102, Share 80/20, Ceiling 144%**
- **“Knowledge is Good”**
- **Creativity**
 - **Flat Spot**
 - **Split Share**
 - **Focus on ALL Elements**
 - **Justify Line vs. Point**
- **Changes Use Same Share**

Cost Incentive Take

Aways

- **Contract Geometry is Somewhat Subjective Assessment - More Art than Science**
- **Maintain Arithmetic Logic of Contract Type**
- **DRAW PICTURE!!!!**
- **Cost Incentive Contract Allows Creativity**
- **Range of Incentive Effectiveness Consideration**
- **3 Methods Provided**
- **Understand Behavior being Driven**
- **Cost Incentive Contracts (FPIF,CPIF, FPIS) are LINES**
- **What the term PTA means**
- **Thomas.Mann@wpafb.af.mil**